**System Requirements**

**P09:InterviewPrepApp**

| **Student ID** | **Name** |
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# Introduction

This project is an AI-powered interview preparation platform that allows job seekers to simulate real interview scenarios. The system collects job-related data from the user, generates role-specific questions using a large language model, and conducts a mock interview through conversational AI (e.g., Vapi or ElevenLabs assistant). After the session, the system provides feedback on user performance, covering aspects such as communication clarity, confidence, technical correctness, and behavioral structure (e.g., STAR method).  
  
**Objectives:**  
- Help students and professionals prepare effectively for job interviews.  
- Provide personalized, role-specific, and skill-specific mock interviews.  
- Deliver actionable feedback to improve communication and technical skills.  
  
**Potential Users:**  
- University students preparing for placements.  
- Professionals switching jobs or industries.  
- Career counseling and training centers.

# System Actors

| **Actor Name** | **Description** |
| --- | --- |
| Interviewee (User) | The primary user of the app who practices interviews by answering questions via voice/video and receives feedback on their performance. |
| Interviewer (AI) | An AI-based interviewer that generates relevant questions, conducts mock interviews, and provides automated evaluations. |
| System (AI Engine & Analytics Module) | The core system that analyzes voice, video, and text responses, evaluates performance, and generates detailed feedback reports. |
| Admin | Manages user accounts, moderates peer-to-peer interactions, and ensures the smooth operation and security of the platform. |
| Cloud Storage & Database Services | Stores user data, interview recordings, transcripts, and analytics reports securely in the backend. |
| Firebase Authentication | Provides secure login, role-based access control, and multi-factor authentication for protecting user accounts. |
| Video & Voice Communication APIs | Enable real-time video calls and voice sessions with low latency, ensuring a realistic interview experience. |
| Speech-to-Text & Voice Recognition | Convert spoken responses into text for analysis and enable AI-driven feedback on clarity, fluency, and correctness. |
| Facial Expression & Sentiment Analysis | Detects non-verbal cues such as eye contact, confidence, and emotional tone to give users feedback on body language. |
| Content Management / Question Bank | Stores interview questions, industry-specific practice sets, and templates, ensuring varied and structured practice. |
| External LLM (Large Language Model) | It powers question generation, evaluates interviewee responses, and delivers detailed feedback on communication, tone, and content quality. |

# Functional Requirements

| **Requirements of User** | |
| --- | --- |
| **Sr#** | **Requirement** |
| 1 | The system shall allow the candidate to register an account using email or social login. |
| 2 | The system shall allow the candidate to log in securely with credentials. |
| 3 | The system shall allow the candidate to reset their password securely if forgotten. |
| 4 | The system shall allow the candidate to manage and update their profile information (name, target job roles, preferences). |
| 5 | The system shall allow the candidate to initiate a session with the voice agent. |
| 6 | The voice agent shall collect job details from the candidate (e.g., job title, company, technical vs. behavioral focus). |
| 7 | The system shall send the captured job details to the LLM for processing. |
| 8 | The system shall generate one contextual starter question based on the job details. |
| 9 | The system shall store the job context and the starter question in the database. |
| 10 | The voice agent shall ask the stored starter question at the beginning of the interview session. |
| 11 | The system shall allow the candidate to respond via voice to interview questions. |
| 12 | The system shall generate the next follow-up question in real time from the LLM, based on the candidate’s response. |
| 13 | The voice agent shall adapt the difficulty of follow-up questions dynamically based on candidate performance. |
| 14 | The system shall enforce a configurable time limit for the interview session. |
| 15 | The system shall record the full interview session (questions, responses, timestamps) in the database. |
| 16 | The system shall generate a structured feedback report at the end of the session. |
| 17 | The system shall allow the candidate to view and revisit past interview sessions and feedback reports. |

| **Requirements of System** | |
| --- | --- |
| **Sr#** | **Requirement** |
| 1 | The system shall integrate with a speech recognition engine (e.g., Vapi or ElvenLabs) to capture and transcribe candidate voice input. |
| 2 | The system shall integrate with an LLM (e.g., Gemini) to generate interview questions dynamically. |
| 3 | The system shall store all questions, answers, and feedback in a secure database. |
| 4 | The system shall log all session events (start, end, errors) for audit and debugging purposes. |

| **Requirements of Administrator** | |
| --- | --- |
| **Sr#** | **Requirement** |
| 1 | The administrator shall be able to manage candidate accounts (create, suspend, delete). |
| 2 | The administrator shall be able to monitor system performance and usage statistics. |
| 3 | The administrator shall be able to configure interview parameters (session duration, question complexity). |
| 4 | The administrator shall be able to review logs and audit trails for compliance and debugging. |

# Non-functional Requirements / Quality Attributes

| **Sr#** | **Requirements** |
| --- | --- |
| 1 | The system shall generate the first interview question within 5 seconds after job details are provided. |
| 2 | The system shall generate follow-up questions within 2 seconds after a candidate’s response. |
| 3 | The system shall maintain 99.5% uptime and recover from crashes within 5 minutes. |
| 4 | All user data and interview sessions shall be stored with encryption at rest and in transit. |
| 5 | The system shall support up to 500 concurrent interview sessions without performance degradation. |
| 6 | The user interface shall be responsive and accessible on desktop and mobile devices. |
| 7 | The system shall provide a feedback report within 15 seconds after interview completion. |

# Security Requirements

| **Sr#** | **Security Risks** | **Potential Losses** | **Controls** |
| --- | --- | --- | --- |
| 1 | Input Manipulation Attack | Misleading feedback leading to loss of customers | Input validation & sanitization for all uploads |
| 2 | Data Poisoning Attack | Cost to retrain models and clean datasets | Strict data provenance and vetting |
| 3 | AI Supply Chain Attacks | Compromise of your app or models leading to data leaks | Use vetted sources, pin versions, verify checksums, and signatures for model binaries and packages. |
| 4 | Broken Authentication | Unauthorized access to personal data | Use robust authentication like MFA, JWT |
| 5 | Unrestricted Resource Consumption | Degraded performance for real users | Monitor resource usage and apply circuit breakers |
| 6 | Unsafe Consumption of APIs | Collateral breaches via third-party integrations | Validate all data from external APIs |

# Security Engineer

| **Name of the Security Engineer** | Abdul Samad |
| --- | --- |

# Use of Generative AI

Generative AI will be used in this project for:

* Generating interview questions from job descriptions.
* Conducting conversational interviews with candidates.
* Analyzing candidate responses for tone, clarity, and correctness.
* Adapting dynamically to the user’s performance during the interview

# Who Did What?

| **Name of the Team Member** | **Tasks done** |
| --- | --- |
| Ahmad Bilal | Functional Requirements |
| Shahid Kabli | Non-Functional Requirements |
| Abdul Samad | Security Requirements |
| Haider Abbas Virk | System Actors |
| Abdul Rehman | Introduction and Use of Generative AI |

# Review checklist

Before submission of this deliverable, the team must perform an internal review. Each team member will review one or more sections of the deliverable.

| **Section** **Title** | **Reviewer Name(s)** |
| --- | --- |
| Introduction | Haider Abbas Virk |
| Actors | Ahmad Bilal |
| Functional Requirements | Abdul Samad |
| Non-functional requirements | Shahid Kabli |
| Security Requirements | Abdul Rehman |
| Use of Generative AI | Haider Abbas Virk |